



FACE RECOGNITION ATTENDANCE SYSTEM

Group Members:

Rameen Fatima Ali(412911)

Manahil Ahmad(407744)

Project Features



Student Details



Train Photo Samples



Take Attendance with Face Detection



Attendance Report (.csv file & mySQL database)



Exit System

Introduction



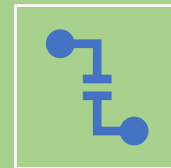
Face recognition project goal:
Developing a computer system capable of quickly and accurately identifying human faces in images or videos captured through webcams or surveillance cameras.



Utilizing face recognition algorithm: Faces will be recognized using a face recognition algorithm to achieve precise identification.



Database integration: Processed images will be compared against an existing database record, allowing for attendance to be marked accordingly.



Uniqueness of human faces: The human face serves as a highly distinctive feature for unique identification due to its low likelihood of deviation or duplication.

Utility



Main issue in former attendance management system: The accuracy of the collected data was a significant concern.

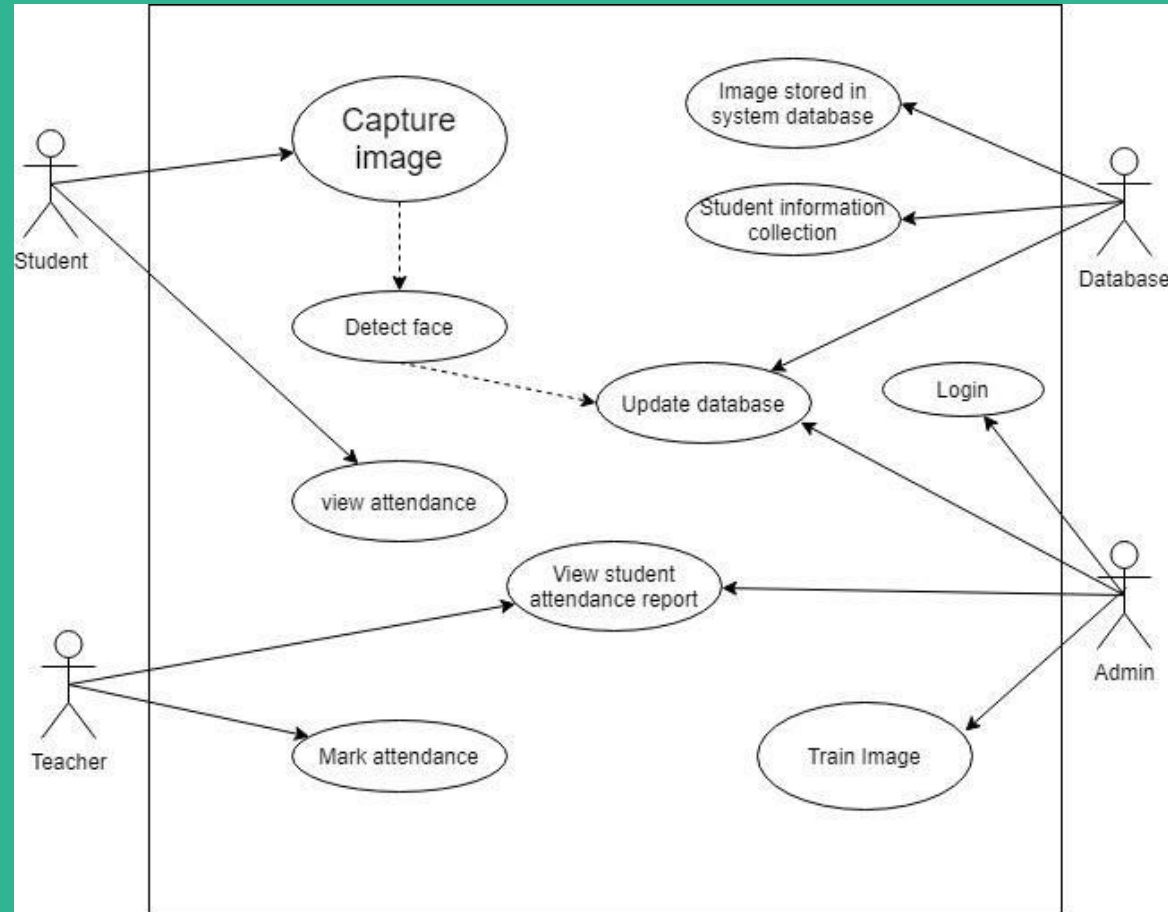


Problem with personal attendance recording: Attendance was not always recorded by the original person, potentially leading to inaccuracies.

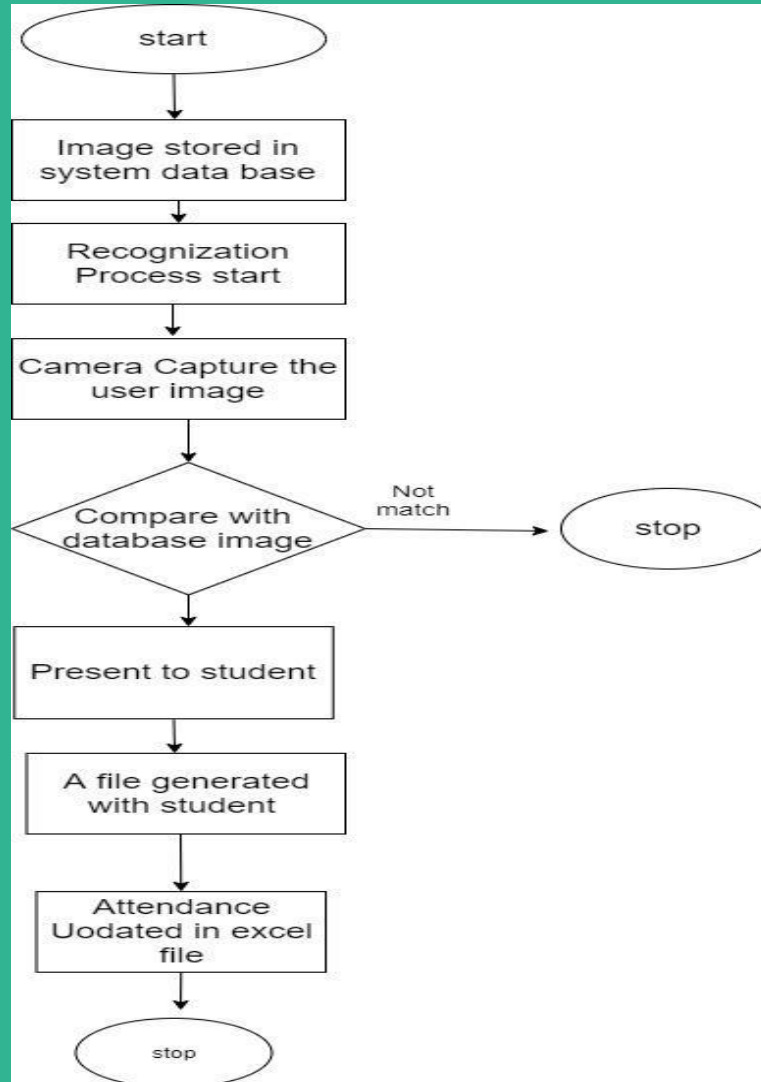


Involvement of third parties: Attendance for a specific individual could be taken by a third party without the institution's knowledge, compromising data accuracy.

Case Diagram



FlowChart



Libraries/Languages

- Haarcascade OpenCV(Face Detection)
- LBPH OpenCV(Face Recognition)- cv2
- Python-3.7/3.12 for programming
- Tkinter for GUI
- MySQL for database management
- OS module in Python
- Numpy as np
- Python- Text to Speech by using pyttsx3

mySQL Database

- MySQL: A robust and scalable database management system.
- Database Schema
- Data Flow

[illegible]

Tkinter Involvement & Python's Role



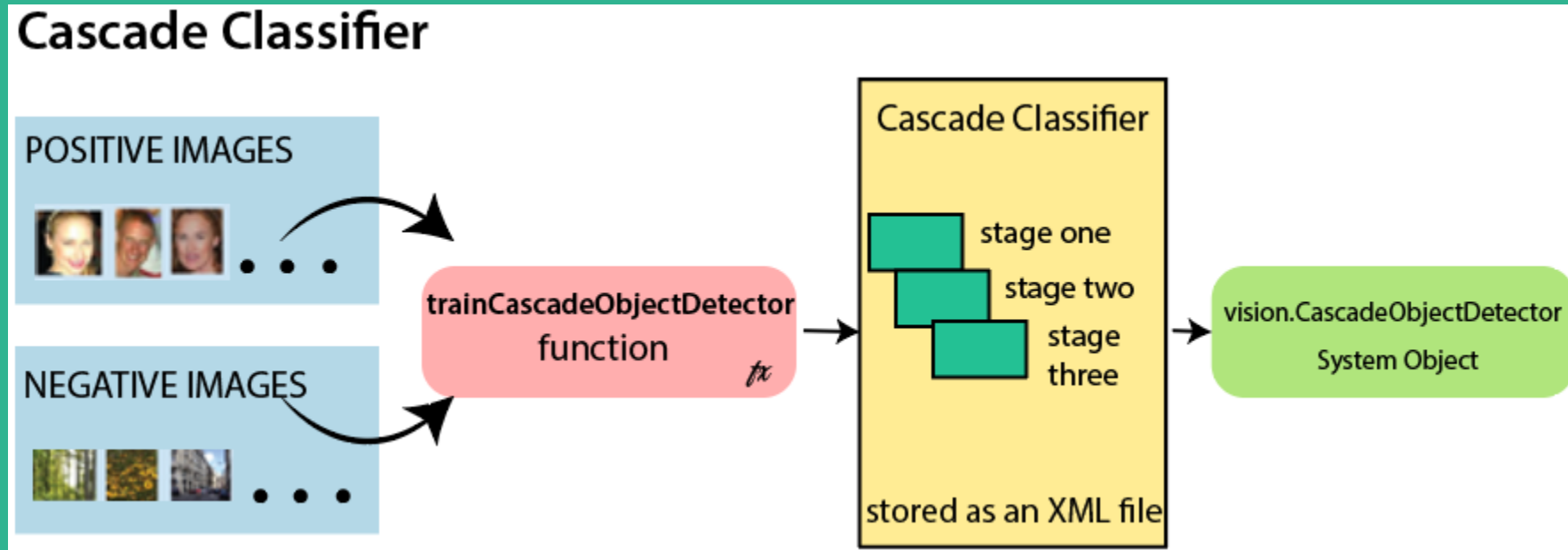
OpenCV

- OpenCV: open-source library used for computer vision
- HAAR-Cascade Detection in OpenCV
- The HAAR cascade is a machine learning approach where a cascade function is trained from a lot of positive and negative images.
- OpenCV provides the trainer as well as the detector.
- Two primary states of the cascade image classifier first one is training and the other is detection.

two types of samples:

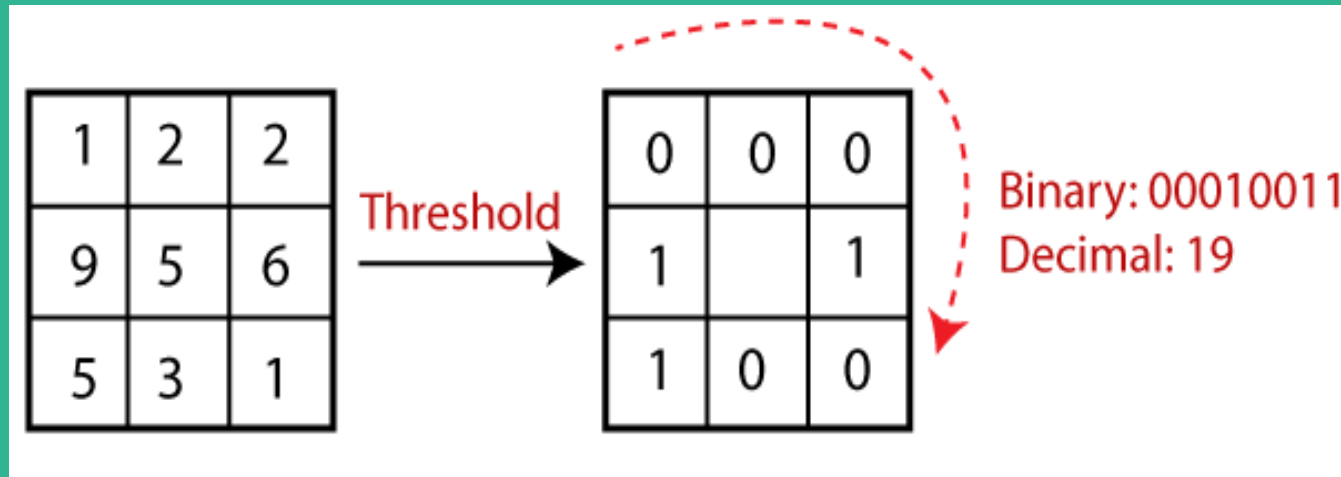
- Negative sample: It is related to non-object images.
- Positive samples: It is a related image with detect objects

Cascade Classifier Mechanism



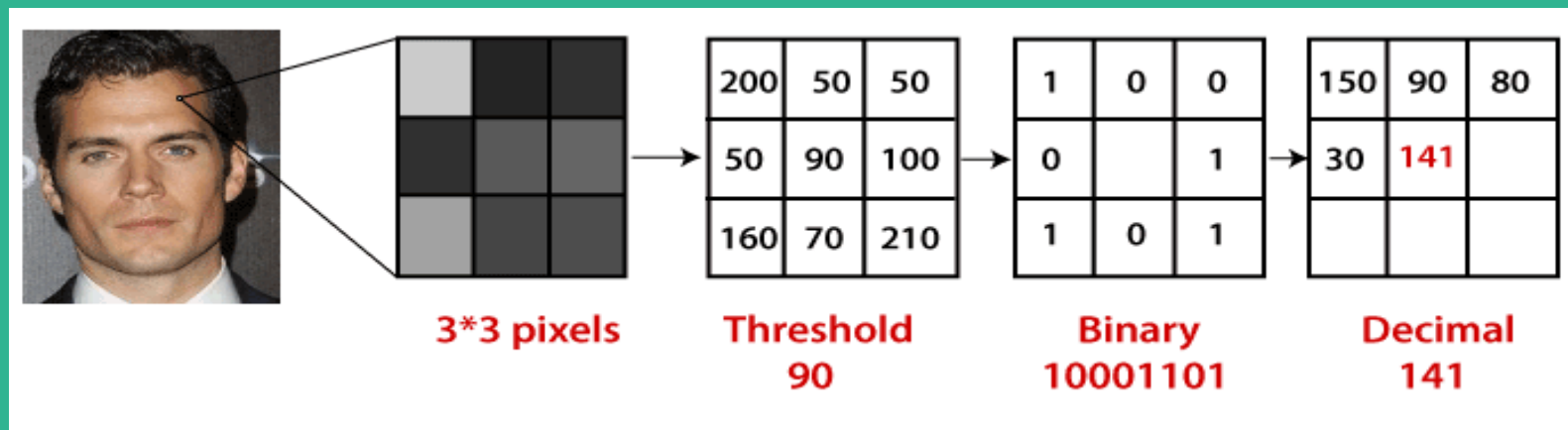
LBPH(Local Binary Pattern Histogram)

LBPH algorithm is a simple approach that labels the pixels of the image thresholding the neighborhood of each pixel.



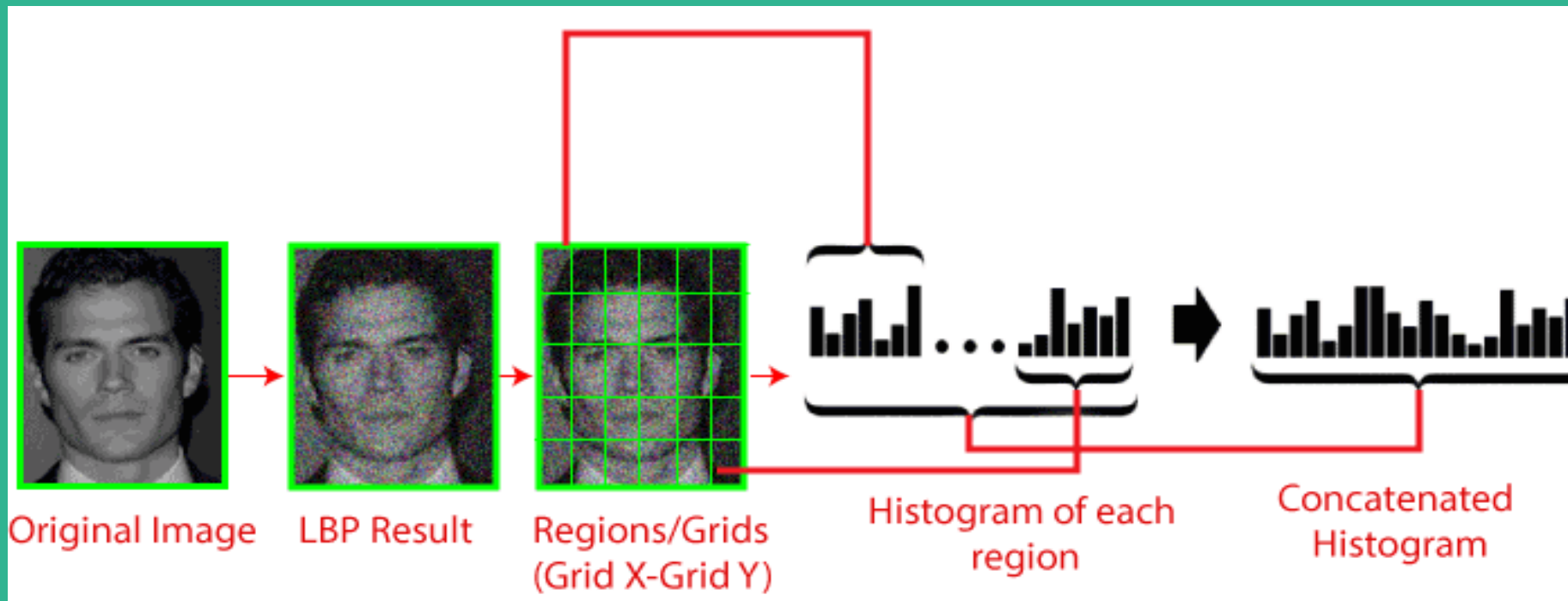
LBPH: Steps of the algorithm

- Selecting the Parameters: The LBPH accepts the 4 parameters : Radius, Neighbors, Grid X, Grid Y
- Training the Algorithm
- Using the LBP operation



LBPH: Steps of the algorithm

Extracting the Histograms from the image



LBPH: Steps of the algorithm

- Performing face recognition:
- Use Euclidean distance based on the following formula:

$$D = \sqrt{\sum_{i=1}^n (\text{hist } 1_i - \text{hist } 2_i)^2}$$

Potential Drawbacks

➤ Environmental Conditions

- Facial Recognition Limitations
- Database Security and Privacy
- Scalability & Performance
- Real-Time Processing Capabilities
- Legal and Ethical Considerations

Potential Drawbacks

- Environmental Conditions
- Facial Recognition Limitations
- Database Security and Privacy
- Scalability & Performance
- Real-Time Processing Capabilities
- Legal and Ethical Considerations

Potential Drawbacks

- Environmental Conditions
- Facial Recognition Limitations
- **Database Security and Privacy**
- Scalability & Performance
- Real-Time Processing Capabilities
- Legal and Ethical Considerations

Potential Drawbacks

- Environmental Conditions
- Facial Recognition Limitations
- Database Security and Privacy
- **Scalability & Performance**
- Real-Time Processing Capabilities
- Legal and Ethical Considerations

Potential Drawbacks

- Environmental Conditions
- Facial Recognition Limitations
- Database Security and Privacy
- Scalability and Performance
- Real-Time Processing Capabilities
- Legal and Ethical Considerations

Potential Drawbacks

- Environmental Conditions
- Facial Recognition Limitations
- Database Security and Privacy
- Scalability and Performance
- Real-Time Processing Capabilities
- **Legal and Ethical Considerations**

References

- [KhomZ/Facial-Recognition-Based-Student-Attendance-System](#): Face recognition-based attendance system is a process of recognizing the faces of the students while taking attendance by using face bio-metrics based on high – definition monitor video and other information technology. In this face recognition project, a computer system will be able to find and recognize human faces quickly and precisely in images or videos that are being captured through a webcam / a surveillance camera. ([github.com](#))
- [Python Project Tutorial, Advance, Face Recognition, Student Attendance System - YouTube](#)

A large, irregular watercolor splash in various shades of teal and turquoise, centered on a white background. The splash has soft, feathered edges and a textured, painterly appearance. The words "Thank You" are written in a dark teal, cursive script across the middle of the splash.

Thank You